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THE URGENT NEED FOR A COMPREHENSIVE, FULLY INTEGRATED, JOINT INTRA-THEATER AEROMEDICAL EVACUATION SYSTEM

by

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Biography

COL Edward F. Mandril is assigned to the Air War College, Air University, Maxwell AFB, AL. COL Mandril is an Army Aeromedical Evacuation Officer with over 21 years' experience. He successfully commanded two Air Ambulance Companies, an Aviation Task Force, and an Aviation Battalion in support of combat and operational missions. He has deployed to Kuwait for Operation Desert Spring, to Egypt for Operation Bright Star, to Haiti for Operation Secure Tomorrow, to New Orleans for Hurricane Katrina relief, to Central America in support of Counter Transnational Organized Crime missions, and twice to Iraq for Operation Iraqi Freedom 05-07 and 07-09. He has also served as a Capability Developer for the Health Readiness Center of Excellence's Capabilities Development and Integration Directorate at Fort Sam Houston, TX and as the Deputy Director for the Army's Medical Evacuation Proponency Directorate at Fort Rucker, AL.

Abstract

As the Joint Force's priorities shift to threats in the Asia-Pacific region, security and stability in eastern Europe, and countering violent extremism and terrorist threats in the Middle East and Africa, it is critical for the Army's Medical Department (AMEDD) and the Joint Staff continue to leverage joint patient evacuation assets from all services and coalition partners to efficiently and effectively treat and evacuate U.S. service members and coalition partners from the battlefield.[1] The intent of this paper is to focus solely on the aeromedical evacuation (AE) portion of the medical evacuation system and show that as Army AE force structure is reduced under programs like the Aviation Restructure Initiative (ARI), military budgets get smaller, resources become more constrained, and evacuation distances increase because of anti-access and area denial (A2AD) strategies and reduced logical footprints in combat theaters, it is essential to establish a joint intra-theater AE system. This joint system must have the capacity, capability, and coordinating organizations necessary to efficiently and effectively evacuate wounded service members and coalition partners. In the wise words of General Dempsey, "The strength of any joint force has always been the combining of unique Service capabilities (in this case AE) into a coherent operational whole…to achieve efficiencies and synergies not previously feasible."[2] This paper reveals that the DoD and combatant commanders currently lack a comprehensive, fully integrated joint intra-theater AE system that is necessary to improve patient survival rates and decrease long-term morbidity. Five recommendations emerge from this paper that are necessary to establish a comprehensive and fully integrated joint intra-theater AE system. These recommendations include: joint evacuation doctrinal and concept changes, establishment of a joint organization for coordinating AE operations, establishment of training proficiencies minimums for aviators and enroute care providers, AE platform and medical material standardization, and AE policy changes.

"I will repeat…the pledge I made to myself, to Congress, and to countless moms, dads, husbands, and wives. Other than winning the wars we are in, my highest priority is providing the best possible care for those who are wounded in combat."[3] – Robert M. Gates

Introduction

The DoD must establish a comprehensive and fully integrated joint intra-theater AE system to coordinate and effectively execute the intra-theater AE mission. This is essential because the U.S. Army does not possess the necessary AE force structure capacity to sufficiently meet the current and future demands for intra-theater AE for all services and coalition partners in accordance with DoD Directive 5100.01 and the SECDEF's Memorandum for Record dated 08 June 2009. DoD Directive 5100.01, *Functions of the Department of Defense and Its Major Components*, tasks the Army to "Provide Intra-Theater Aeromedical Evacuation."[4] Since a gap in Army AE capacity has been identified, it has been necessary to leverage the joint force to mitigate this capacity gap in order to coordinate, evacuate, treat, and manage the lifesaving AE mission on today's battlefields and anticipated battlefields of the future. Each service in the joint force has at least the basic capability to perform lifesaving missions in a combat environment, but there are no standards across the services that specify how the AE mission is to be conducted or minimum standards that must be upheld. There are distinct differences in how each Service organizes, trains, and equips its assets to move and provide enroute care to wounded service members on the battlefield by CASEVAC or MEDEVAC means; therefore, it is imperative that a comprehensive and fully integrated joint intra-theater AE system, supported by joint doctrine, concepts, organizations, standards, minimum training and proficiency requirements, and policy be established to efficiently and effectively execute the AE mission.

Thesis

It is vital to establish a comprehensive and fully integrated joint intra-theater aeromedical evacuation system to ensure the joint force has the patient evacuation procedures, capacity, capabilities, standards, and coordinating organizations necessary to efficiently and effectively manage, intelligently task, treat, and evacuate joint and coalition casualties to medical treatment facilities to improve survival rates and decrease long-term morbidity of patients. This can be achieved by making joint AE concepts and doctrinal changes, designating joint service assets with the additional mission of AE, establishing a joint organization for coordinating AE operations, establishing training proficiencies minimums for AE aviators and enroute care providers, standardizing AE platforms and equipment, and making changes to AE policy.

Army's AE Capacity Gap

Since 2009, the Army's intra-theater AE capacity shortfall has been intensified by Secretary of Defense Robert Gate's directive requiring for a 1-hour evacuation time for patients categorized as Urgent which intensified the need for a comprehensive, fully integrated joint intra-theater AE system.[5] In his memo, Secretary Gate's recognized the strategic value of the AE mission and, therefore, implemented the new AE standard of a one-hour mission completion time for Urgent evacuation missions. Secretary Gates stated, "The single most important factor in the execution of the MEDEVAC mission is patient care. The effort to save human life warrants accepting additional risk when there is a reasonable expectation of success. Our unwavering commitment to Soldiers, families, and our nation and the morale and expectations of Soldiers are the cornerstones of this change."[6] In effect, this directive necessitates an AE helicopter be located within approximately 40 miles of all U.S. and coalition forces operating in a combat theater.[7] Prior to 2009, the standard time for evacuation of Urgent patients was 2-hours from the time of the 9-Line

MEDEVAC request initiation to the time the patient was evacuated to the appropriate medical treatment facility (MTF). The previous standard required about half the AE assets that are required today to sufficiently provide AE coverage throughout a JOA, but had some adverse effects on patient outcomes. The analysis conducted by the Joint Trauma System (JTS), a chartered DoD Center of Excellence organization that strives to optimize survivability and decrease the mortality and morbidity of wounded service members, showed that casualty survival was significantly improved for patients after the SECDEF's 1-hour evacuation standard was implemented in 01 June 2009 (86.8% casualty survival rate prior to implementation, compared to 91% casualty survival rate after implementation).[8]

The SECDEF's new 1-hour evacuation standard exacerbated the AE capacity gap for the Army because the demand signal for AE assets approximately doubled. In 2009, the Medical Evacuation Proponency Directorate at Fort Rucker, AL conducted an independent and inclusive analysis which demonstrated a requirement for 54 Air Ambulance Companies in Phase IV (Steady State Operations) of Total Army Analysis (TAA), but the Army only possessed 38 Air Ambulance Companies in its force structure to meet all of DoD's AE demands.[9] These results included nine additional Air Ambulance Companies that were added to the Army's Reserve Component AE force structure in 2007 to meet emerging demands in OIF, OEF, and other operations around the world. In 2013, the Army's AE force structure was reduced to 36 Air Ambulance Companies during the Aviation Restructure Initiative (ARI) which widened the Army AE capacity gap. By 2009, increasing demand for Army Air Ambulance Companies in Iraq and Afghanistan resulted in an average Army AE deploy: dwell ratio of 1 year deployed to 0.8 of a year at home, exceeding the Army Active Component (AC) DoD planning objective of 1:2 and Reserve Component (RC) planning objective of 1:5.[10]

In order to adequately resource the Army AE capacity gap that existed during Operation Enduring Freedom (OEF) in Afghanistan, the Joint Staff Surgeon had to leverage medical and aviation assets from other Services. Air Force "Pedro" helicopters, whose primary mission was combat search and rescue/personnel recovery, and V-22 Osprey, a multi-mission aircraft with Marine aircrews and augmented Navy corpsmen, were re-missioned to assist the Army with AE. In addition to joint AE asset augmentation in OEF, there were several coalition partners, the Swedes, Germans, French, and British, that provided limited AE support as well.[11] The Marines also utilized CASEVAC assets which capitalized on rotary wing "lifts of opportunity" to move casualties will little to no medical attention or regulation to the nearest medical treatment facility (MTF). A significant benefit of working in a joint and coalition environment in OEF was the exposure to dissimilar medical evacuation platform capabilities and different levels of enroute standards of care. The issue that resulted was there was not a fully integrated joint intra-theater patient evacuation system codified in doctrine and organizations to coordinate, manage, intelligently task, and establish minimum standards for these disparate joint AE capabilities to efficiently and effectively evacuate and treat wounded service members and coalition partners. Intelligent tasking became an immerging joint AE doctrinal term defined in JROM Memo 048-15 as the process that incorporates operational considerations, clinical considerations, and patient regulating considerations into a comprehensive guidance to inform real-time patient evacuation activities throughout the joint operations area.[12]

Despite the importance of the AE mission, which has had significant backing from Secretary of Defense Robert Gates, an "ad-hoc" joint intra-theater patient AE system was put into place that was inadequately manned, trained, and equipped to optimally coordinate, integrate, and standardize AE assets and personnel from across joint and coalition services in the JOA.[13] This

paper addresses the shortcoming of that "ad-hoc" joint intra-theater AE system in an effort to lay the groundwork for the establishment of a comprehensive and fully integrated joint intra-theater AE system for future conflicts. This proposed comprehensive, fully integrated joint intra-theater AE system would be manned and resourced to coordinate, manage, intelligently task, and array joint and coalition AE assets and providers within the JOA to effectively and efficiently execute the AE mission to improve patient survival rates and decrease long-term morbidity.

Joint Evacuation Concepts and Doctrinal Changes

Joint Publication 4-02, Health Service Support, and other joint publications currently lack standardized and institutionalized joint intra-theater evacuation and enroute care doctrine and concepts necessary to direct or guide the execution of the joint intra-theater aeromedical evacuation mission because these joint publications have not been updated with the latest joint AE organizations like AF Pedros, Marine Ospreys, and Patient Evacuation Coordination Cells (PECCs), treatment concepts like tactical combat casualty care (TCCC) and enroute blood product administration, operational considerations like the SECDEF 1-hour evacuation mandate, and the newest AE terminology from OEF and OIF. During OEF, numerous CENTCOM AARs noted abundant unclarity in AE concepts and terminology like "AE mission authority" verse "AE launch authority," intelligent tasking of AE platforms, required AE response times, patient regulating from POI to MTF, designated verse dedicated AE platforms, medical capabilities associate with roles or levels of care, medical capabilities of various AE platforms, and procedures for patient movement item exchange or tracking among the joint AE community.[14] Simple evacuation terminology like MEDEVAC, CASEVAC, TACEVAC, AE, POI, etc were also unclear within the joint AE community. The Army, as the Lead Agent for JP 4-02 and most medical joint publications, must update these publications with AE doctrine and concepts that

capture the latest intra-theater AE best practices and terminology in order to provide the essential procedures and language to assist the Services in resolving evacuation and treatment challenges in the future. Joint doctrine and concepts must ensure AE and enroute critical care capabilities remain agile, flexible, and readily available within the JOA in future conflicts because the joint force will face challenges like anti-access and aerial denial (A2AD), complex and diverse operating environments, a range of traditional and new adversaries and threats, employment and integration of new technologies, longer evacuation distances, and collaboration with numerous organizations, agencies, nations, and cultures.[15]

Combatant commanders and their patient evacuation coordination cells (PECCs) must be prepared to utilize joint doctrine and concepts to employ joint AE assets and enroute critical care capabilities across multiple domains with diverse platforms and treatment capabilities in the future. This will require a high degree of joint force interoperability that can only be achieved with joint concepts and doctrine that sufficiently supports joint, integrated AE operations. Advances in medical technology, treatments, and clinical practice guidelines that decreased healthcare personnel burdens and improved survival rates during patient transport in OEF will also be critical to the ongoing improvement in the delivery of enroute critical care and must be captured in joint concepts and doctrine.[16] Joint doctrine must incorporate the emergent roles and responsibilities of the joint patient evacuation coordination cell for coordinating all intra-theater patient movement activities in the pre-hospital setting utilizing existing and emergent movement and treatment capabilities available within the JOA.[17] Doctrine terminology must be standardized and common evacuation language and concepts must translate across the joint force to be effective. Since AE operations in the future will most likely be executed in a coalition environment like OEF, joint AE doctrine should be synchronized with NATO terminology

because NATO has the power and influence to successfully integrating coalition partners into a comprehensive and fully integrated intra-theater AE system.

Designating Joint Service Organizations with the additional mission of AE

In a period of force and budget reduction, the DOD is better served focusing on balancing the U.S. military's mix of AE capabilities throughout the joint services in a comprehensive, fully integrated intra-theater AE system, rather than building up the Army's AE force structure capacity to provide Army Support to Other Services (ASOS). This approach will help reduce risk by creating access to a broad set of joint AE capabilities without the additional cost of building additional or new AE organizations. In this way, "a capabilities mix first approach"[18] to AE will enhance the prospects of developing existing sources of AE capabilities that will provide a competitive advantage for the U.S. military on the battlefield rather than continuing to overuse the Army's already overburdened AE forces structure. In order for this to be successful, DoD's Defense Health Agency and the Joint Staff Surgeon, the Joint Proponent for Intra-theater AE, must ensure specific Service doctrine is amended to assign the permanent AE mission to units like the Air Force "Pedro" helicopters, whose primary mission is combat search and rescue/personnel recovery, and the multi-mission V-22 Osprey units that utilize augmented Navy corpsmen as their enroute care providers. The aforementioned organizations were re-missioned during OEF to assist the Army with the AE mission because of the Army's AE capacity gap. To be more effective and responsive during future conflicts, these joint service units must have the intra-theater AE mission incorporated into their standard mission sets. This will afford these organizations, with this newly assigned AE mission, the opportunity to organize, train, equip, and prepare themselves to be in a state of readiness to effectively integrate and execute the joint AE intra-theater mission in future JOAs when called upon.

Criticism of a Fully Integrated Joint Intra-theater AE System

Some defense analysts are critical of implementing a fully integrated joint intra-theater AE system and reasonably argue that the U.S. Army has been using helicopters with flight medics to provide intra-theater AE to treat and move injured service members off the battlefield since the Korean War and the AE mission should remain a core competency of the U.S. Army. They state this is why the DoD directed the Army with the Intra-theater AE mission in DODD 5100.01, *Functions of the Department of Defense and Its Major Components*. Instead of leveraging joint or coalition multi-mission air assets with little or no AE training or experience to assist with the AE mission in combat, these critics advocate growing the capacity of dedicated Army AE assets to meet the future AE demands, not only for the U.S. Army, but also for the joint services and coalition partners. They contend that the Army is better organized, trained, and equipped to manage and execute the critical life-saving AE mission than any other Service and a single Service would prevent the establishment of a watered-down, lowest-common-denominator AE system that would result from a joint initiative. In a mission where time is of the essence, they argue that eliminating layers of jointness and inter-service coordination overrides the importance of joint matters and arguably will lead to improved survival rates and decreased morbidity of patients. Additionally, they assert that by using the Army as the sole AE intra-theater Service provider, the system will be standardized across the JOA and that other Services and Coalition partners can use their air assets for their core missions without conflict and additional costs for training and equipment their air assets for AE.

Some of these criticisms are valid, but in an era of military fiscal and force reduction, it is not feasible or reasonable to expect to grow the Army's AE capability by 50% (an additional 18 Air Ambulance Companies) to meet projected AE joint and coalition demands in the future.[19] This is

especially true when Joint and Coalition partners proved in OEF that they were up to the task of executing the AE mission (at a fraction of the cost of growing Army capacity) and, as time went on, they became more efficient and effective at AE as they ironed out procedural problems and integrated with the PECC. Their unity of effort and effectiveness in executing AE in OEF is supported by the highest patient survivability rate in any major combat operation at 91%.[20] In addition, there is no guarantee that Army AE will always be available on the complex and contested battlefields of the future, so it is not good if only one Service, in this case the Army, retains all of the AE capability. DoD is better served utilizing a mix of AE capabilities from Joint and Coalition partners that provides commander's a broad set of joint AE capabilities and options that they can take advantage of to minimize risk and increase effectiveness. These advantages include: speed, range power, patient handling capacity, rescue equipment, and increase medical provider skill levels. A comprehensive, fully integrated intra-theater AE system with diverse platforms and capabilities will only catalyze additional improvements in the effectiveness of AE, streamline the AE decision making process, improve unity of effort among Joint Services regarding AE, increase patient survivability, and decrease long-term morbidity.

Establishing a Joint Evacuation Coordination Cell

A comprehensive, fully integrated joint intra-theater AE system must be implemented and centered around an organization that will function as the cognitive center or "brain" in the joint operations area (JOA). This organization would coordinate, synchronize, and intelligently task AE assets and flatten essential medical and evacuation information throughout the joint theater patient evacuation system. This organization would effectively synchronize joint AE assets and would ensure all Services were familiar with the evacuation common operating picture (COP) in the JOA. During OEF, U.S. Army Corps and Division Headquarters that deployed as an

International Joint Coalition (IJC) and Combined Joint Task Forces (CJTFs) respectively, staffed "ad hoc" patient evacuation coordination cells with personnel from their organic Surgeon Cell, augmented patient regulators, clinicians, and evacuators from service and coalition components, and tasked AE Officers via a World Wide Augmentation System (WIAS) which tasked Army AE Officers to perform joint patient evacuation coordination cell (JPECC) OIC functions in the absence of a formal U.S. manning and equipping document for such an organization.[21] These "ad hoc" patient evacuation coordinate cells (PECC), whose personnel composition varied from PECC to PECC, functioned as the nucleus of the joint intra-theater AE system for the IJC and within each of the Reginal Commands (RCs) during OEF. The PECC coordinated, intelligently tasked, and arrayed joint AE assets with disparate capabilities through the JOA to take advantage of their distinct and advantageous capabilities, which included: platform speed, range, power, patient handling capacity, special medical or rescue equipment, and medical provider skill levels. The PECC intelligently tasked and logically assigned joint intra-theater evacuation coverage areas and missions to specific joint and coalition AE assets based on their unique capabilities e.g. V-22 Ospreys with Corpsmen for extended distances, CH-47 Chinooks with medical emergency response teams (MERT) to critical care and mass casualty (MASCAL) scenarios, Air Force HH-60 Pavehawks with PJs equipped with offensive weaponry to hot landing zones, and HH-60 Blackhawks with Paramedics and rescue hoists to mountain evacuation missions.[22] The IJC's PECC also served as a coordination organization for all RC PECCs and AE assets, to include coalition, in the JOA and managed the RC PECCs as they intelligently tasked these AE assets because they possessed medical mission authorities.

The PECCs established the standard operating procedures for AE with COCOM and Division planners for the JOA to ensure joint interoperability. This was done primarily because joint intra-

theater AE doctrine and AE coordinating organizations were severely lacking. PECCs confirmed that all AE assets where capable of providing 24/7 evacuation coverage in day, night, and night vision device conditions and would reassign sectors to Army AE at night when this was not the case.[23] They would confirm that each AE platform included a medical provider with a minimum medical qualification skill sets like a National Registry Paramedic with Critical Care and would augment AE flights with Enroute Critical Care Nurses (ECCNs) when this was not the case.[24] ECCNs carried a higher level of medical capability (advanced airway management, hemodynamic and vasoactive medication management, advanced assessment skills, etc) as they augmented medics on AE flight during point of injury (POI) missions and transfers of critically ill and injured between MTFs.[25] The PECCs were definitely the appropriate organization to provide or coordinate medical regulating services, clinical validation, transit visibility of patients, and patient movement planning within the JOA. They would communicate AE requirements to the Service components who were responsible for executing the AE mission and would generate operational AE plans and procedures for the JOA and each respective RC in coordination with the IJC and RC staffs. PECCs coordinated patient regulating and movement with supporting activities, AE elements, and MTFs to ensure seamless patient evacuation and in transit visibility. A joint patient evacuation coordination cell (JPECC) is essential to efficiently and effectively coordinate and manage the evacuation and enroute care of U.S. and coalition service members from point of injury (POI) through the medical roles of care in the JOA to decrease casualty mortality and morbidity rates in future conflicts.

The “ad hoc” Patient Evacuation Coordination Cells (PECCs), utilized in OEF, must to be synchronized with NATO doctrine and codified into U.S. joint doctrine and organizations as a joint patient regulating and medical evacuation coordination cell because Combatant

Commanders current do not possess any AE Officers on their staffs to conduct AE planning and coordination for the JOA.[26] "Ad hoc" PECCs currently fill the gap in Geographic Combatant Commands (GCCs) to man, manage, and establish the business rules necessary to coordinate and intelligently task joint intra-theater AE assets within the JOA and will be an essential organization to coordinate a comprehensive, fully integrated joint intra-theater AE system in future conflicts.

Establishing Training Proficiency Minimums for AE Personnel

Enroute Care Providers: A comprehensive, fully integrated joint intra-theater AE system is not just necessary to evacuate wounded service members from the battlefield to a medical treatment facilities, but exists to provide quality enroute care to increase survivability rates and decrease long-term morbidity. The current joint intra-theater AE system lacks minimum standards for knowledge, skills, and abilities for enroute care providers, coordinators, and evacuators. With a recognized 91% survival rate for service members evacuated off today's battlefield, one might question whether this is a gap worth pursuing.[27] A recent study by the Department of Defense appointed Joint Theater Trauma System (JTTS) concluded that with necessary improvements to pre-hospital enroute care, most notably the increase from Emergency Medical Technician – Basic (EMT-B) to a Nationally Registered Paramedic with Critical Care (CCFP) and the ability to administer blood products enroute, that an astonishing 25% of the 9% of service members that perished in OIF and OEF would have survived.[28] The combined total of U.S. casualties in Iraq and Afghanistan during this time period of the study totaled 49,549 of which 6,332 perished.[29] This means that hypothetically, with CCFP providers applying blood products and tactical combat casualty care (TCCC) principles onboard AE aircraft, the Services could have potentially saved 1,558 more service member's lives. The CCFP skill set and ability

to administer blood products would also have improved the level of care provided to every evacuated casualty leading to reduced hospitalization and recovery times and decreased long-term morbidity for these service members. The House Armed Services Committee (HASC) concluded that the CCFP should be the new medical qualification standard for flight medics.

In the 2013 National Defense Authorization Act, the House Armed Services Committee (HASC) noted the Defense Health Board's (DHB), the Federal Advisory Committee to the SECDEF, assessment linking mortality rates directly to the level of the enroute care provider's medical qualifications and training. They specifically noted that evacuation flights with Critical Care Flight Paramedic (CCFP) resulted in increased patient survivability rates.[30] As a result, the HASC directed the Secretary of the Army to establish by September 1, 2012, a department-wide standard that required all Army in-flight medical care providers to be Critical Care Flight Paramedic (CCFP) certified.[31] The problem was, the HASC did not direct other Services outside of the Army to provide the same level of medical training proficiency minimums for their in-flight medical care providers. As a result, a lesser medical skill set is possessed by the Navy and Marines which utilized Naval Corpsmen (EMT-Basics) as their enroute care providers. Additionally, the Air Force Pararescue (PJ) are National Registry Paramedics but lack the additional Critical Care Training mandated in the NDAA, while our coalition partner generally possess a much higher medical certification level than CCFP (e.g. doctors or nurses) because of their limited number of AE platforms. Due to the disparity in medical skill sets, all three U.S. military services where augmented with Enroute Critical Care Nurses (ECCNs), when available, to accompany MEDEVAC missions with enroute providers possessing a skill set below CCFP.[32]

The center of gravity for the effective delivery of enroute care in a comprehensive, fully integrated joint intra-theater AE system is a competent enroute care provider. This requires that a

minimum medical skill set needs to be designated for all services regarding enroute care on AE platforms to guarantee that each service member serving in the JOA is provided the very best possible care if needed. Since 2002, over 40 after action reports from Iraq and Afghanistan have noted that enroute care provider training and skill level is a key issue, and have recommended the implementation of paramedic-level training as a solution.[33, 34] Since the 2013 NDAA mandated the Paramedic with Critical Care as the minimum acceptable standard for Army AE enroute care providers, it would only make sense to apply that same standard to all services or coalition partners to increase joint interoperability and to uphold our commitment of providing the best possible care to our wounded service members.

Aviators – U.S. rotary wing aviator's training and proficiency is very similar, but coalition partners were either incapable or reluctant to fly at night with night vision goggles and forward looking infrared (FLIR) which forced Army AE aircrews to provide evacuation coverage from dusk to dawn in out of sector areas to cover down on those non-fully mission capable AE forces. This significantly increased risk to Army AE pilots who were unfamiliar with the terrain, conditions, and procedures of the new operating area which they covered down on while operating in the most demanding and dangerous mode of flight, at night. This also placed an unnecessary demand on Army AE units from other operating sectors that were already task saturated with AE missions in their own assigned operating areas. During my interview with CPT Anthony Leiding, the RC-East PECC OIC from March 2012 to February 2013, he noted that the Swedes and Germans in RC-North would only fly AE missions during the day and when enemy threat was no longer present.[35] The British, operated in RC-Southwest from FOB Bastion with CH-47s with medical emergency response teams (MERT), would routinely exceed the CENTCOM 15-minute launch standard, taking up to 90 minutes to respond to a 9-line

MEDEVAC request which put injured Soldiers on the battlefield at serious risk of mortality or long term morbidity.[36] The French, operating in RC-East, provided AE with multi-mission platforms which, at times, interfered with their ability to respond to MEDEVAC requests when they were using their air platforms for missions other than AE.[37] Without fully mission capable aircrews and dedicated, not designated, AE platforms to fly and operate in all modes (day, night, and night vision device) in all RCs, this significantly constrained the joint intra-theater AE system and further bolstered the need for a comprehensive, standardized, and fully integrated intra-theater AE system.

During Secretary of Defense Gates' visit to Afghanistan in the fall of 2008, he learned firsthand "that non-U.S. NATO MEDEVAC helicopters didn't fly in "low illumination" – dusk or dark – or in bad weather or into unsecured landing zones. Of course, these were most of the times, places, and situations in which MEDEVAC would be needed most."[38] Just as troubling, Gates discovered "that when U.S. Air Force helicopters in Afghanistan were needed for MEDEVAC, the request had to be approved by the senior commander, which caused added delays when every minute counted. The Air Force was also opposed to the 60-minute evacuation standard and the Navy (Marines) were ambivalent. Only the Army and my own staff supported the change I was pushing."[39] Gates stated, "this MEDEVAC problem was about troops' expectations and their morale, and by God, we were going to fix it. Their (the Services') responses really pissed me off." Gates emphasis on AE standardization, interoperability, and responsiveness to quickly evacuate wounded service members off the battlefield under all conditions led to "a little war inside the Pentagon" to increase Army AE assets on the battlefield and to provide the tools they needed do their jobs most effectively.[40] Aside from the SECDEF's 60-minute evacuation standard that was written into policy, most standardized tactics,

techniques, and procedures and aircrew requirements that were put in place in OEF were never implemented into joint doctrine, organizations, or policies. In order to establish a comprehensive and fully integrated joint intra-theater AE system in the future, minimum standards for AE aircrews and operating procedures need to be captured in joint AE doctrine, organizations, and DoD Directives (policy) and Instructions.

Patient Evacuation Coordinators – Geographic Combatant and Division Commanders do not have designated joint organizational structures for establishing the joint intra-theater operating procedures and oversight of joint intra-theater AE activities in the JOA.[41] As a result, "ad hoc" patient evacuation coordinate cells composed of varying blends of medical regulators, evacuators, and clinicians were stood up to source this gap in OEF. Most PECC personnel and GCC/DIV Surgeon Cell staffs lack any standardized training in joint intra-theater AE operations which often led to insufficient coordination planning and understanding of AE procedures across the JOA. PECC personnel and GCC/DIV Surgeon Cell staffs should be required to attend either the Joint Medical Planners Course, NATO's Patient Evacuation Coordination Cell Course, or participate in a Joint Exercise were joint AE assets are employed prior to deploying to a JOA. This will ensure they receive the necessary training on the patient movement process for joint intra-theater AE, so they can intelligently assign, task, and coordinate evacuation missions to appropriate AE assets to meet patient medical requirements while maintaining the AE common operating picture within the JOA and each RC. This AE training for PECCs and GCC/DIV Surgeon Cell staffs is essential to establish a comprehensive, fully integrated joint intra-theater AE system in the future.

Standardizing AE Platforms and Equipment

It is vital to establish a comprehensive and fully integrated joint intra-theater AE system with evacuation platforms that have diverse capabilities to improve the quality and speed of evacuating injured service members from POI to the next appropriate role of care or to transfer injured service members between MTFs. The enduring principles—conformity, proximity, flexibility, mobility, continuity, and control— form the foundation of the AMEDD Operating Concept and should be applied to the joint intra-theater aeromedical evacuation system.[42] A significant benefit of operating in joint and coalition environments over the past 15 years of war in Iraq and Afghanistan has been the exposure to different medical evacuation platforms, equipment, and enroute care capabilities that embody these principles. Diverse AE platforms give combatant commanders and their PECCs options for "intelligently tasking" AE assets to evacuate wounded service members in challenging environments where power may be needed in mountains, speed may be required for long distances, patient carrying capacity may be required in mass casualty (MASCAL) scenarios, weapons may be required for force protection due to threat, and range may be required in contested situations like A2AD or in operating environments with reduced logistical footprints. Though there are many advantages to having diverse joint AE platforms operation within a JOA, some level of standardization must exist between all platforms and equipment to ensure interoperability in a comprehensive, fully integrated joint intra-theater AE system.

All AE platforms should possess some basic minimum characteristics like rescue hoists, patient handling systems, navigation systems, radios, and forward looking infrared or sensor capabilities to enable AE pilots to integrate and evacuate patients off the battlefield in challenging environmental conditions. The problem that exists in the current AE systems and in

OEF is that there are no joint AE standards for rescue equipment (e.g. hoists, litter systems, extraction equipment, forward looking infrared, jaws of life, etc.), patient movement items (e.g. medical equipment, patient monitoring equipment, oxygen systems, blood products, etc.), platform cabin interiors (lighting compatible with treating patients, environmental controls, patient handling systems, electric outlets for medical equipment, etc.), space dimensions required to adequately treat patients, and patient carrying capacity minimums (litter and ambulatory) on AE platforms. Joint AE rescue equipment and patient movement items should also be modular, interoperable, plug-and-play components that have a smaller footprint, are easily transportable, and have air worthiness releases (AWRs) to be operated on and exchanged between multiple joint AE platforms with the patients.[43] This is critical during tail-to-tail patient transfers between different AE platforms like HH-60s, V-22s, and C-17s where critical care patients have numerous medical devices attached to them and various medications and blood products being administered to keep them alive or stable. In AARs from OEF, it was noted that critical time was wasted swapping medical equipment on and off patients during tail-to-tail transfers because units were concerned about the accountability of the medical equipment that was on their unit's property books and whether these devices had AWRs to authorized their use on these different AE platforms. This medical equipment was not standardized and consumed critical time during the patient transfers or exchanges that deteriorated the quality of care being administered to the patient. A universal PMI system with standardized patient movement items with AWRs for multiple AE platforms and a central database for tracking medical equipment via scan technology needs to be implemented in the joint AE community (much like the Air Force's PMI system) to prevent time consuming equipment swaps on and off critical care patients that could

contribute to adverse outcomes to patients during patient transfers at ambulance exchange points, MTFs, or mobile aeromedical staging facilities (MASFs).

By implementing minimum standards for rescue equipment, PMI, cabin interiors, and treatment space, critical casualties will receive better quality of care which will improve survival rates and decrease long-term morbidity. U.S. TRANSCOM, a functional combatant command, would be the logical agency to established these standards since they are already designated as DoD's Single Manager for Patient Movement.[44] In accordance with JP 4-01, a DoD Single Manager is a Military Department or agency, in this case TRANSCOM, that is designated by the Secretary of Defense to be responsible for management of specified commodities or common service activities on a Department of Defense-wide basis. A comprehensive, fully integrated joint intra-theater AE system needs a coordinating agency like TRANSCOM to direct, govern, and publish minimum AE platform and equipment standards to increase interoperability between divergent AE platforms on the battlefield to more effectively and efficient evacuate and treat patients.

AE Platform and Treatment Capability Differences in OEF

During OEF, several dedicated and designated joint platforms executed the intra-theater AE mission with various levels of enroute care providers ranging from combat lifesavers and EMT-basics on Marine UH-1 platforms, paramedics on Air Force HH-60 Pavehawks, a mix of EMT-basics and paramedics on Army HH-60M Blackhawks, an EMT-basic independent duty Navy corpsman on Marine V-22s, and critical care physicians on Air Force C-17 Critical Care Air Transport Teams (CCAT) and British CH-47 Medical Emergency Response Teams (MERT).[45] Such a disparate level of care on AE platforms completely supports the need from a minimum acceptable enroute care provider standard like CCFP. There was also a huge differential in the

rescue and medical equipment that AE units carried onboard their platforms. Marine CASEVAC UH-1s carried a combat lifesaver bag, Army MEDEVAC HH-60M carried a full complement of rescue and medical equipment, and British MERT basically brought an operating table with associated medical equipment on back of the CH-47.[46] Once again, such incongruent differences in medical and rescue equipment on AE platforms pleads for a minimum standard to be established that all AE units must meet.

Changes to AE Policy

In DoD Directive 5100.01, *Functions of the Department of Defense and Its Major Components,* the Secretary of Defense assigned the Army the function of providing "intra-theater aeromedical evacuation."[47] The problem is that the U.S. Army does not possess the necessary AE force structure capacity to sufficiently meet the current demand of 54 Air Ambulance Companies as indicated by the Army's Medical Evacuation Proponency Directorate's analysis during the 2013 Total Army Analysis.[48] One of the contributing factors to this shortfall in AE capacity is the fact that the Army does not earn any additional force structure for additional support to other services (ASOS) or coalition partners. As a result, the Army AE capacity is unable to meet current and future demands for intra-theater AE for all services and most coalition partners in a JOA in accordance with DoD Directive 5100.01. This necessitates the requirement for the other Services to provide or repurpose aviation and medical assets to close this Army AE capacity gap or shortfall. The utilization of other Services' aviation and medical capabilities ensures adequate AE assets are available throughout the JOA to support joint and coalition operations. The Secretary of Defense should designate the Army as the "Executive Agent" for DoD's Intra-theater Aeromedical Evacuation mission and issue a DOD Instruction outlining the Army's authorities within the joint AE community. Designating the Army as the

Executive Agent for the Intra-theater AE mission would be in line with the intent of DoD Directive 5100.01, which assigns the Army the intra-theater aeromedical evacuation mission. This would provide the Army the authority to coordinate common AE functions and procedures throughout the Services and would give the Army the authority, direction, and control to establish unity of effort across DoD AE enterprise. Designation the Army as the Executive Agent for Intra-theater AE would provide the Army the authorities for establishing a comprehensive, fully integrated joint intra-theater AE system.

Recommendations

1. **Doctrine** - During OEF, numerous CENTCOM AARs noted abundant unclarity in AE concepts and terminology which hindered joint intra-theater AE operations. Recommend the Army, as the Lead Agent, updating JP 4-02 and other joint publications with new joint AE doctrine and concepts that capture current intra-theater AE best practices. This will provide the necessary language and ideas to assist the services with synchronizing and integrating their AE assets to address the challenges in future JOAs.

In order to adequately resource the Army AE capacity gap that existed during Operation Enduring Freedom, the Joint Staff Surgeon had to leverage aviation and medical assets from other Services to execute AE. Recommend updating specific service doctrine to assign the aeromedical evacuation mission permanently to units like the Air Force "Pedro" helicopters, that traditionally only execute combat search and rescue/personnel recovery, and Marine V-22s, that normally only transport cargo and troops. By officially assigning the AE mission to these joint units, it will afford these organizations the opportunity to organize, train, equip, and prepare

themselves to be ready to effectively integrate and execute the joint AE intra-theater mission when called upon again in future JOAs.

The probability of the U.S. military working with NATO partners in a coalition environment like OEF in future conflicts is highly likely. Recommend that Joint AE doctrine be synchronized with NATO Allied Joint Publication to standardize terminology, concepts, and procedures for successfully integrating coalition partners into future intra-theater AE operations.

2. **Organizations** – The goal of joint intra-theater AE is to ensure the delivery of "the right patient, to the right place, at the right time, to receive the appropriate care" and the ad-hoc Patient Evacuation Coordination Cells (PECCs), with intelligent tasking capability in OEF, executed this extremely well. Recommend permanently establishing PECCs within each Geographic Combatant Commands and each Army Division that are composed of dedicated AE officers, medical regulating officers, and clinical personnel with experience in AE and tactical combat casualty care (TCCC) concepts and equipped them with the appropriated tools to communicate, coordinate, and maintain the AE common operating picture (COP). These PECCs will provide the following functions: 1) medical mission authority for the JOA, 2) intelligently task, monitor, and direct patient evacuation to and within the JOA based on medical necessity, capability, and capacity, 3) provide direction, oversight, and coordinating authority for patient evacuations to and between MTFs within the JOA, 4) regulate patient movement to and between MTFs within the JOA and coordinate with TRANSCOM for patient movement out of the JOA, 5) maintain data on intra-theater evacuations to improvement performance and ensure the highest quality of care, 6) communicate with MTFs, joint evacuation commanders, and medical brigades to maintain a current evacuation common operating picture (COP) for the JOA, and 7) develop

AE plans and procedures with COCOM and Division staffs to coordinate and synchronize AE assets within the JOA.

Enroute Critical Care Nurses (ECCNs) were invaluable during OEF because they augmented enroute care providers with minimal medical skill sets and provided damage control resuscitation (DCR), damage control stabilization (DCS), and administered blood products for critically wounded servicemen being evacuated from POI or being transferred between MTFs. Recommend ECCNs be codified into joint doctrine and organizations to address gaps in enroute critical care between the services until a joint minimum standard for enroute care can be implemented across the Services.

3. **Training** – DoD's Defense Health Agency (DHA) and the Joint Staff Surgeon, the Joint Proponent for Joint Theater Patient Evacuation, should establish and publish training proficiencies minimums for all AE personnel: enroute care providers, AE aviators, and AE coordinators and GCC/Division medical staffs.

Enroute Care Providers: Despite substantial advancements in care during intra-theater AE, a lack of standardization in the level and quality of care available to service members evacuated from theater has resulted from the wide range of platforms with differing capabilities and provider skill sets. Since 2002, over 40 after action reports from Iraq and Afghanistan have noted that enroute care provider training and skill level is a key issue, and have recommended the implementation of paramedic-level training as a solution. Per the 2013 NDAA, all Army enroute care providers are required to be Flight Paramedics with Critical Care (FPCC). Recommend that this minimum medical skill of FPCC be expanded from the Army to all Services that have enroute care providers operating on their AE platforms to improve survival rates and decrease long-term morbidity of patients.

AE Aviators: NATO MEDEVAC helicopters pilots would not fly in low illumination, dusk or dark, bad weather, or to unsecured landing zones during OEF. This was a serious problem because those were most of the times, places, and situations in which MEDEVAC was needed. Recommend the Joint Staff Surgeon work with NATO to establish AE Standardization Agreements (STANAGs) which dictate that NATO AE Aviators be qualified to flight in all modes (day, night, and night vision device) in order to provide 24/7 aeromedical evacuation coverage in a JOA

Most PECC personnel and the GCC and Division Medical Staff in OEF lacked any standardized training in joint intra-theater AE operations which often led to insufficient coordination planning and understanding of AE procedures across the JOA. Recommend all PECC and GCC/DIV medical staff be required to attend the Joint Medical Planners Course, NATO's Patient Evacuation Coordination Cell Course, or participate in a Joint AE Exercise prior to deployment into a JOA. This will ensure they receive adequate training on the AE process, possess the ability to intelligently task and coordinate diverse AE assets appropriately, and are able to maintain the evacuation common operating picture within the JOA.

4. **Material** – All AE platforms should possess some basic minimum characteristics like rescue hoists, patient handling systems, navigation systems, medical equipment sets, radios, and forward looking infrared or sensor capabilities to enable AE pilots to integrate, evacuate, and sufficiently treat patients being moved off the battlefield in challenging environmental conditions. Recommend U.S. TRANSCOM, DoD's Single Manager for Patient Movement,[49] be designated by DoD as the governing agency to publish minimum AE platform and equipment standards to increase interoperability between divergent AE joint platforms. This standardization would lead to a more effectively and efficient evacuation and treatment of patients which would

increase survival rates and decrease long term morbidity. TRANSCOM, through its Global Patient Movement Joint Advisory Board (GPMJAB), should publish and govern joint AE standards for rescue equipment, patient movement items, platform cabin interiors, space dimensions required to adequately treat patients being evacuated, and patient carrying capacity minimums (litter and ambulatory) on AE platforms.

5. **Policy**- The Army AE capacity is unable to meet current and future demands for intra-theater AE for all services and most coalition partners in a JOA in accordance with DoD Directive 5100.01. This necessitates the requirement for the other Services to provide or repurpose aviation and medical assets to close this Army AE capacity gap or shortfall for Intra-theater AE. Recommend the Office of the Secretary of Defense (OSD) designate the Army as the Executive Agent for DoD's Intra-Theater Aeromedical Evacuation mission and publish a DOD Instruction outlining the Army authorities within the joint AE community. This would provide the Army the authorities to standardize and integrate common capabilities, functions, and procedures throughout the Joint Services regarding AE and provide the Army the authority, direction, and control to establish unity of effort across DoD. The Army, as the Executive Agent, would then be able to establish a comprehensive, fully integrated joint intra-theater AE system.

Conclusion

It is crucial to establish a comprehensive and fully integrated joint intra-theater aeromedical evacuation system to ensure the joint force has the patient evacuation procedures, capacity, capabilities, standards, and coordinating organizations necessary to efficiently and effectively treat and evacuate casualties to improve survival rates and decrease long-term morbidity of patients. Joint publications, with new updated joint AE doctrine and concepts that capture current intra-theater AE best practices and terminology, will provide the necessary procedures and language to

assist the Joint Services with synchronizing and integrating their AE assets on complex battlefields of the future. A joint "capabilities mix first approach" to AE creates access to a broad set of joint evacuation capabilities from all Services for combatant commanders and their PECCs to intelligently task to efficiently and effectively evacuate wounded service members from challenging environmental and combat conditions throughout the JOA. The PECC, or cognitive brain of the joint intra-theater AE system, is vital in maintaining the AE common operating picture and intelligently tasking joint AE assets with diverse capabilities through the JOA and must be codified into GCC/DIV organizations. The center of gravity for the effective delivery of enroute care in a joint intra-theater AE system is a competent enroute care provider. The Critical Care Flight Paramedic (CCFP) must become the minimum acceptable skill set for all enroute care providers regardless of Service because they possess the trauma training skills that are necessary for improving survival rates and decreasing long term morbidity for critical care patients. Finally, establishing training proficiencies minimums for AE aviators, coordinators, and enroute care providers, standardizing AE platforms and equipment, and making changes to AE policy to improve integration and synchronization of the Services, like designating the Army as the Executive Agent for Intra-theater AE, will all contribute to the establishment and effectiveness of a comprehensive and fully integrated joint AE system.

Annex 1: Definitions

Joint Proponency – A Service, combatant command, or Joint Staff directorate assigned coordinating authority to lead the collaborative development and integration of joint capability with specific responsibilities designated by the Secretary of Defense. (SECDEF Memo 03748-09) **– Joint Staff Surgeon**

DoD Single Manager – A Military Department or agency designated by the Secretary of Defense to be responsible for management of specified commodities or common service activities on a Department of Defense-wide basis. (JP 4-01)**- U.S. TRANSCOM**

Additional Support to Other Services – DODD 5100.01, Functions of the DoD and its Major Components dated December 21, 2010, assigned the Army the responsibility to "Provide intra-theater aeromedical evacuation" thus creating an Army Support to Other Services (ASOS) requirement and demand. **– U.S. Army**

Joint Operations Area – An area of land, sea, or airspace, defined by a geographic combatant commander, in which a joint force commander conducts military operations to accomplish a specific mission. Also called JOA. (JP 3-0)

Joint Theater Patient Evacuation – Those theater activities (medical care, transportation, logistics, C4I, medical regulating, etc.) that when integrated provide for the effective enroute care and efficient movement of patients through the appropriate roles of care from point of injury through a return to duty decision or evacuation out of the joint operations area. (JROC Memo 048-15)

Aeromedical Evacuation – The movement of patients under medical supervision to and between medical treatment facilities by air transport. Also called AE (JP 4-02)

Casualty Evacuation – The unregulated movement of casualties that can include movement to and between medical treatment facilities. Also called CASEVAC (JP 4-02)

Lead Agent — 1. An individual Service, combatant command, or Joint Staff directorate assigned to develop and maintain a joint publication. (CJCSM 5120.01) 2. In medical materiel management, the designated unit or organization to coordinate or execute dayto-day conduct of an ongoing operation or function. Also called **LA.** (JP 4-02)

Executive Agent — A term used to indicate a delegation of authority by the Secretary of Defense or Deputy Secretary of Defense to a subordinate to act on behalf of the Secretary of Defense. Also called **EA.** (JP 1)

Mobile Aeromedical Staging Facility (MASF). The MASF provides rapid response patient staging in support of small-scale contingencies, humanitarian/disaster response, and initial stages of major theater war. The MASF is designed to provide forward support with the smallest footprint and is usually the AE interface with SOF. (JP 4-02)

Patient Evacuation Coordination Cell – Provides theater level medical evacuation coordinating and regulating functions for all patients, moving beyond formations boundaries, in conjunction with force components and theater logistic and movement control agencies. It is responsible for patient tracking and the maintenance of the medical treatment facility (MTF) database. Also call PECC. (NATO AJP 4.10)

Intelligent Tasking – A process that incorporates operational considerations, clinical considerations, and patient regulating considerations into a comprehensive guidance to inform real-time patient evacuation activities throughout the joint operations area. (JROC Memo 048-15)

Regulated Movement- The comprehensive, coordinated evacuation activities

undertaken once the Intelligent Tasking process has been initiative. Regulated movement is therefore guided by an appropriate C2 node designated by the operational commander. (JP 4-02)

Patient Movement Items – The medical equipment and supplies required to support patients during aeromedical evacuation, which is part of a standardized list of approved safe-to-fly equipment. (JP 4-02)

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